

## UNCLASSIFIED

## RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2003

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

**07 - Operational System Development****0101122F AIR LAUNCHED CRUISE MISSILE****4797**

COST (\$ in Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
4797 Flight Testing & Navigation Enhancement	9,973	20,070	29,804	11,868	2,244	3,701	5,721	386	0	94,700
Quantity of RDT&E Articles	0	5	0	0	0	0	0	0	0	0

In FY04, Project 4797, Flight Testing & Navigation Enhancement, includes new start efforts funded by Cost of War Defense Emergency Response Funds (DERF).

**(U) A. Mission Description**

The AGM-86B, Air Launched Cruise Missile (ALCM), is a subsonic, air-to-surface strategic nuclear missile, operational since 1982. Armed with a W-80 warhead, it is designed to evade air and ground-based defenses in order to strike targets at any location within any enemy's territory. The ALCM is designed for B-52H internal and external carriage.

A Service Life Extension Plan (SLEP) was developed to meet an AF Long Range Plan requirement to extend ALCM Service Life to FY30. The results of Service Life Extension Program (SLEP) studies identified system components that cannot be sustained beyond the standard service life. The current system is experiencing obsolescence of parts/components. Missile components and support equipment are becoming non-supportable. Service Life Extension of this critical weapon is essential to meet Air Combat Command (ACC) and United States Strategic Command (USSTRATCOM) Single Integrated Operational Plan (SIOP) commitments.

Initial SLEP assessment required the development and acquisition of new Conventional Air Launched Cruise Missile (CALCM)/ALCM Test Instrumentation Kit (CATIK) flight test payload doors, replacement of the current navigation system, and replacement of Operational Test & Evaluation (OT&E) hardware and software. CATIK commenced in FY00 based on the AF decision to maintain this weapon system beyond its current design life. Previous payload doors were purchased to support the original service life only. CATIK development efforts are driven by depleting test assets, parts obsolescence, Range Command Council 319 (RCC-319) safety requirements and re-certification of the Flight Termination System. Five CATIK RDT&E test articles will be developed to support Developmental Test & Evaluation (DT&E) flight tests. The five test articles will be used to conduct one ALCM Operational Test Launch, one ALCM Joint Test Assembly (JTA) integration test to ensure compatibility with the warhead package, one CALCM Operational Test Launch, one Captive Carry and a backup test asset.

CATIK payload doors, containing range transponder and battery, are required to be replaced due to depleting test assets to continue flight tests beyond FY06. The new CATIK payload doors will provide an inventory of test assets for continued flight testing through FY16, based on current flight test requirements. W-80 LEP (current interface) - CATIK will be designed to a JTA-R1. If the W-80 LEP program changes interface, CATIK will require modification and additional funding/schedule. The CATIK payload door is a critical component for determining Weapon System Reliability (WSR) and for supporting the W-80 Life Extension Program (LEP) (current interface).

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(U) A. Mission Description Continued

The current Inertial Navigation Element (INE) has been identified as the ALCM item with largest number of unscheduled maintenance hours. The INE is beset with parts obsolescence, little or no spares inventory, and manufacturers who have gone out of business or no longer support the antiquated technology. The current INE units are only maintainable through the use of a decreasing number of cannibalized parts from other INE units. The redesigned INE will utilize a more robust and maintainable solid-state circuitry.

Operational Test & Evaluation (OT&E) hardware and software replacement will occur concurrently with the CATIK and INE development efforts.

FY04 EMD efforts consist of qualification tests of the CATIK doors. Individual component qualification will have already been completed at the subvendors. FY05 EMD efforts is flight tests finishing up with the flight test report FY06. Contract period of performance ends April 06.

Cruise Missile Functional Ground Testing (FGT) is required to provide the capability to non-destructively accomplish functional flight simulation of a full-up missile flight profile on the ground to obtain additional reliability data. This capability will provide critical reliability data without the costs of flight test missions and will also retain the missiles in the inventory. This effort will develop the software and hardware for an existing test facility for accomplishment of the ground tests.

The W-80 LEP replaces warhead components to extend its service life. The National Nuclear Security Administration (NNSA) is responsible for most of the refurbishment costs associated with the W-80 warhead. The Air Force is responsible for funding ALCM W-80 integration. Integration includes evaluation of interface control changes as part of the Initial Concept Design (ICD), missile testing, and logistics requirements necessary to support a First Production Unit (FPU) delivery of 2008.

(U) FY 2002 (\$ in Thousands)

(U)	\$0	- Accomplishments/Planned Program
(U)	\$3,185	- Continued CATIK payload door Interface Design/Development and Flight Termination System Engineering Change Proposal (ECP)
(U)	\$3,323	- Continued update of CATIK Interface Control Documents to Include Flight Termination System Requirements, acquire required hardware
(U)	\$1,150	- Completed Pre-EMD INE Hardware Interface Development, Testing and Integration
(U)	\$2,315	- Completed Pre-EMD INE Software Emulation Development, Testing and Integration
(U)	\$9,973	Total

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PROJECT

**07 - Operational System Development****0101122F AIR LAUNCHED CRUISE MISSILE****4797**(U) **A. Mission Description Continued**(U) FY 2003 (\$ in Thousands)

(U) \$0 - Accomplishments/Planned Program

(U) \$15,635 - Continue CATIK payload door Interface Design/Development; pre-planning for integration testing

(U) \$2,360 - Continue update of CATIK Interface Control Documents and purchase hardware

(U) \$2,075 - Begin INE Software Emulation Development, Testing and Integration

(U) \$20,070 Total

(U) FY 2004 (\$ in Thousands)

(U) \$0 - Accomplishments/Planned Program

(U) \$180 - Conduct flight test planning for integration testing

(U) \$320 - Continue update of CATIK Interface Control Documents and assemble hardware

(U) \$4,500 CATIK Test and Evaluation/Government costs

(U) \$3,495 Begin INE Hardware Interface Development, Testing and Integration

(U) \$7,609 Continue INE Software Interface Development, Testing and Integration

(U) \$3,600 Begin Cruise Missile Functional Ground Test (FGT) software design & development

(U) \$3,600 Begin Cruise Missile FGT hardware design/development

(U) \$2,800 Conduct FGT system/missile integration and test

(U) \$1,810 ALCM interface change evaluations and contractor Interface Control Document support for W-80 LEP

(U) \$125 ALCM/W-80 integration data development

(U) \$1,765 ALCM/W-80 integration ground test and flight test support

(U) \$29,804 Total

(U) **B. Budget Activity Justification**

These programs are in Budget Activity 7, Operational System Development, due to efforts supporting a fielded, post Milestone III operational weapon system.

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<b>07 - Operational System Development</b>				<b>0101122F AIR LAUNCHED CRUISE MISSILE</b>				<b>4797</b>			
<b>(U) C. Program Change Summary (\$ in Thousands)</b>											
		<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Total Cost</u>						
(U)	Previous President's Budget	6,772	26,713	11,649	73,939						
(U)	Appropriated Value	6,841	20,513								
(U)	Adjustments to Appropriated Value										
	a. Congressional/General Reductions	-69	-217		-286						
	b. Small Business Innovative Research				-670						
	c. Omnibus or Other Above Threshold Reprogram		-226		-226						
	d. Below Threshold Reprogram	3,250			3,250						
	e. Rescissions	-49			-49						
(U)	Adjustments to Budget Years Since FY 2003 PBR			18,155	18,155						
(U)	Current Budget Submit/FY 2004 PBR	9,973	20,070	29,804	94,113						
<b>(U) Significant Program Changes:</b>											
FY02 funding increased due to CATIK Flight Termination System (FTS) range safety requirements.											
FY04 funding increase is a result of Cost of War funding to develop cruise missile Functional Ground Test (FGT) capability, and to begin interface evaluation and flight test support of W-80 Life Extension Program (LEP).											
<b>(U) D. Other Program Funding Summary (\$ in Thousands)</b>											
		<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	MPAF, Missile Modifications (BA 03, PE 0101122F, P-13)	0	1,961	11,478	21,342	24,491	9,529	9,746	9,875	Continuing	TBD
(U)	MPAF, Missile Modifications Initial Spares (BA 04 PE 0101122F, P-16)	0	1,006	1,661	377	178	182	185	188	Continuing	TBD
(U)	MPAF, Replenishment Spares (BA 04, PE 0101122F, P-17)	5,181	4,143	4,076	4,151	4,258	282	286	292	Continuing	TBD
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BUDGET ACTIVITY

07 - Operational System Development

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(U) **D. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) OPAF, Electronics and Telecommunications Equipment (BP83) (BA 03, PE 0101122F, P-18)	1,251	1,312	1,315	1,335	1,378	1,408	1,432	1,455	Continuing	TBD

(U) **E. Acquisition Strategy**

Begun in FY00, CATIK payload door development efforts are performed by Boeing utilizing a Cost Plus Award Fee (CPAF) contract. A CATIK Low Rate Initial Production contract will be awarded in the 3rd quarter FY04 to ensure CATIK production assets are available in late FY06/early FY07 to continue ALCM flight testing beyond FY06 and support W-80 LEP (current interface).

In FY02, Pre-EMD INE replacement studies were performed by TRW and Boeing. TRW's effort is defined requirements for enhancement of the INE computer utilizing their patented RePLACE technology using a Time and Materials (T&M) contract. Boeing's efforts concentrated on complete INE replacement using a Cost Plus Award Fee (CPAF) contract. Both INE Pre-EMD efforts will complete in 3rd quarter FY03 at which time a downselect will be conducted and an EMD contract awarded.

The Cruise Missile FGT development will be performed by the prime contractor, utilizing a CPAF contract.

The ALCM/W-80 LEP integration will be performed by the prime contractor utilizing a Time and Materials (T&M) engineering assignment on an existing sustainment contract.

(U) **F. Schedule Profile**

	<u>FY 2002</u>				<u>FY 2003</u>				<u>FY 2004</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Development Contract Milestones												
(U) -- Contract Award - CATIK (2QFY00)												
(U) -- Contract Award - INE (3QFY01)												
(U) CATIK Development Milestones												
(U) -- Critical Design Review (CDR)									X			
(U) -- Integration/Qual Testing											X	

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(U) <b><u>F. Schedule Profile Continued</u></b>												
		<u>FY 2002</u>				<u>FY 2003</u>				<u>FY 2004</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
(U) -- CATIK Production Contract Award											X	
(U) --Functional/Physical Config Audit (2QFY05)												
(U) -- 5 Prototype CATIKs delivered (2QFY05)												
(U) -- Flight Testing (3QFY05)												
(U) INE Pre-EMD Milestones												
(U) -- System Requirements Review (SRR)							*					
(U) Functional Ground test Development												
(U) -- PDR										X		
(U) -- CDR											X	
(U) -- FQT (3QFY05)												
(U) ALCM/W-80 Life Extension Program (LEP)												
(U) -- Contract Award									X			
(U) -- Ground Test Support										X	X	X
(U) -- Flight Test Support											X	X

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)			DATE
			February 2003
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT	
07 - Operational System Development	0101122F AIR LAUNCHED CRUISE MISSILE	4797	
(U) <b>A. Project Cost Breakdown (\$ in Thousands)</b>			
		<u>FY 2002</u>	<u>FY 2003</u>
(U) CATIK:			<u>FY 2004</u>
(U) Hardware Development			
(U) - Test Articles		0	5,000
(U) - Interface Development		2,785	8,095
(U) - Testing/Integration		400	2,540
(U) - Development of Interface Control Documents		3,323	2,360
(U) Hardware Assembly			320
(U) Test and Evaluation/Government Costs			4,500
(U) Software Development			
(U) - Operational Flight Software		0	0
(U) - Automated Test Equipment Development		0	0
(U) - Testing/Integration		0	0
(U) INE:			
(U) Hardware Definition/Development			
(U) - Card Development		1,150	0
(U) - Nuclear Certification		0	0
(U) - Testing/Integration		0	0
(U) Software Definition/ Development			
(U) - Operational Flight Software		2,027	2,075
(U) - Nuclear Certification		100	0
(U) - Mission Planning		0	0
(U) - Testing/Integration		88	0
(U) - Data Collection/Documentation		100	0
(U) Functional Ground Test (FGT)			
(U) - FGT Software Design/Development			3,600
(U) - FGT Hardware Design/Development			3,600
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2003		
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07 - Operational System Development				0101122F AIR LAUNCHED CRUISE MISSILE				4797		
(U) <u>A. Project Cost Breakdown (\$ in Thousands) Continued</u>										
				<u>FY 2002</u>		<u>FY 2003</u>		<u>FY 2004</u>		
(U) - System/Missile Integration and Test								2,800		
(U) ALCM/W-80 Life Extension Program										
(U) - ALCM/W-80 LEP Interface Control Change evaluation and design support								1,810		
(U) - ALCM/W-80 integration data development								125		
(U) - ALCM/W-80 integration ground test & flight test support								1,765		
(U) Total				9,973		20,070		29,804		
(U) <u>B. Budget Acquisition History and Planning Information (\$ in Thousands)</u>										
(U) <u>Performing Organizations:</u>										
<u>Contractor or</u>		<u>Contract</u>								
<u>Government</u>		<u>Method/Type</u>		<u>Award or</u>		<u>Performing</u>		<u>Project</u>		
<u>Performing</u>		<u>or Funding</u>		<u>Obligation</u>		<u>Activity</u>		<u>Office</u>		<u>Total Prior</u>
<u>Activity</u>		<u>Vehicle</u>		<u>Date</u>		<u>EAC</u>		<u>EAC</u>		<u>to FY 2002</u>
<u>Product Development Organizations</u>										<u>Budget</u>
Development:										<u>FY 2002</u>
Boeing - CATIK		Eng Asgn/ CPAF		Jul 00		29,727		29,977		8,191
TRW - INE		Eng Asgn/T&M		Jun 01		1,804		1,804		1,441
Boeing - INE		Eng Asgn/ CPAF		Jul 01		3,066		3,066		1,200
INE EMD		TBD		Jul 03		TBD		TBD		2,075
Boeing FGT		CPAF		3QFY04		TBD		9,000		9,500
Boeing W-80 LEP		Eng Asgn/T&M		1QFY04		TBD		2,396		2,396
<u>Support and Management Organizations</u>										
OC-ALC/PSM				1QFY04		200		200		101
										200
										652
										953
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(U) <u>Performing Organizations Continued:</u>									
<u>Test and Evaluation Organizations</u>									
Utah Test Range	MIPR	TBD	2,850	2,850	0	0	2,375	475	2,850
49th Test Wing	MIPR	TBD	2,425	2,425	0	0	1,975	450	2,425
Responsible Test Org	TBD	TBD	175	175			150	25	175
Eglin AFB	MIPR	3QFY04	500	500			500	0	500
49th Test Wing (W-80 LEP)	MIPR	2QFY04	1,104	1,104			1,104	8,000	9,104
(U) <u>Government Furnished Property:</u>									
<u>Contract</u>									
<u>Item</u>	<u>Method/Type</u>	<u>Award or</u>	<u>Delivery</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Description</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Date</u>	<u>to FY 2002</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
N/A									
<u>Support and Management Property</u>									
N/A									
<u>Test and Evaluation Property</u>									
None									
				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>				<u>to FY 2002</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development				10,832	9,973	20,070	23,500	14,318	78,693
Subtotal Support and Management				101			200	652	953
Subtotal Test and Evaluation				0	0		6,104	8,950	15,054
Total Project				10,933	9,973	20,070	29,804	23,920	94,700

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